

REMARKS

The office action of December 14, 2005, has been carefully considered.

It is noted that claims 4 and 5 are rejected under 35 U.S.C. 112, second paragraph.

Claims 7 and 9 are rejected under 35 U.S.C. 102(b) over WO 00/56777.

Claims 8, 10 and 11 are rejected under 35 U.S.C. 103(a) over WO 00/56777.

Claims 1-6 are rejected under 35 U.S.C. 103(a) over WO 00/56777 in view of the patent to Perrin, et al.

In view of the Examiner's rejections of the claims, applicant has amended claims 4 and 5, and added new dependent claim 12.

It is respectfully submitted that claims 4 and 5 presently on file particularly point out and distinctly claims the subject matter which applicant regards as the invention. Applicant has

amended claims 4 and 5 to address the instances of indefiniteness pointed out by the Examiner.

In view of these considerations it is respectfully submitted that the rejection of claims 4 and 5 under 35 U.S.C. 112, second paragraph is overcome and should be withdrawn.

It is respectfully submitted that the claims presently on file differ essentially and in an unobvious, highly advantageous manner from the methods and constructions disclosed in the references.

Turning now to the references and particularly to WO 00/56777, it can be seen that this reference discloses an object with radially-varying properties and an apparatus and method of operating the same. PCT-777 discloses a method of preparing an object with radially-varying properties, which is used to prepare graded-index plastic optical fiber in the field of communication or image transmission (col.3 lines 42-45). The method comprises the following steps:

- preparing at least two liquid compositions (col.6 line 3) with different refractive indices (col.5 line 52), each composition comprising at least one polymer and a substance

adapted to vary the refractive index being present in at least one of said compositions (col. 8 line 38) : monomer mixtures of MMA and BMA,

- filling a preform formation system (1, 2) with said compositions (col.8 line 36 and more),
- obtaining a solid cylindrical object in said system (col. 9 lines 8-9), and
- transforming said cylindrical object to a gradient index plastic optical fiber by thermal drawing (col.9 lines 21-24).

Therefore, after completion of the polymerization, the MMA-BMA copolymer is cooled to or below the glass transition temperature and the outer container is removed to obtain a solid cylindrical object (col. 9 lines 6-9).

PCT-777 provides a method of preparing an object with radially-varying properties in order to reduce the inherent problem of gradient-index plastic optical fibers, which is to produce optical fiber with a low attenuation due to complicated structure of the extrusion die and contaminants resulting from the thermal decomposition of polymer from a co-extrusion process (col.3 lines 6-14). PCT-777 does not disclose a preform formation system having the features of the claims of the present

application and providing the benefits of such a system.

In view of these considerations it is respectfully submitted that the rejection of claims 7 and 9 under 35 U.S.C. 102(b) and the rejection of claims 8, 10 and 11 under 35 U.S.C. 103(a) over the above-discussed reference are overcome and should be withdrawn.

The patent to Perrin discloses a method of manufacturing a graded-index plastics optical fiber. This patent corresponds to European reference EP 1 067 222 discussed in the specification of the present application and discloses a method of fabricating a graded index plastics material optical fiber in which the refractive index varies continuously between the center and the periphery. The method includes the following steps:

- preparing two compositions with different refractive indices,
- filling insulated storage tanks of a mixer system with the compositions,
- mixing the compositions in a mixer whose upper portion contains a ball cartridge so as to obtain a graded index liquid preform in the lower portion of the mixer and the step of mixing the compositions is effected by modifying pressurized flows of the

compositions,

- reducing the diameter of said preform, which retains a graded index, with the aid of a conical portion extending the lower portion of the mixer,
- drawing the reduced diameter preform to obtain a graded index plastics material optical fiber,
- cross-linking by optical means to produce a cross-linked three-dimensional array, and
- spooling the cross-linked graded index plastics material optical fiber.

The whole of the method is carried out continuously. The method solves the problem of manufacturing methods relying in compounds diffusing between adjacent layers (col.2 lines 33-37) in proposing a method comprising an active mixing step given by forcing two compositions to mix (col.3 lines 29-49).

The Examiner combined Perrin, et al. with PCT-777 in determining that claims 1-6 would be unpatentable over such a combination. Applicant submits that the combination does not teach the presently claimed invention. In considering Perrin et al. as the closest prior art, claim 1 of the present invention differs from what Perrin et al. discloses in claiming that the production

of the liquid preform comprises a step with substantially no flow of said compositions along said preform formation system.

The problem solved by the present invention is to find a method in which a liquid preform can be produced without stresses in order that the production time of the preform can be adjusted as a function of the characteristic of the composition chosen, the temperature of the system and the nature of the interaction between the compositions and the kinetics of those interactions. Therefore, the method provides a liquid preform without modifying pressurized flows of the compositions.

PCT-777 does not suggest any solution to solve the problem concerning a liquid preform produced without stresses, without modifying pressurized flows of the compositions.

On the contrary, PCT-777 proposes a method comprising a step of obtaining a solid preform (ie. solid cylindrical object).

A person skilled in the art could not find any solution in PCT-777 to solve the problem of Perrin et al. mentioned above since a liquid preform and a solid preform do not present the same flexibility with respect to the drawing step and the same process

in view of the fiber production.

First, a solid preform does not allow the adaptation of the phase upstream of drawing to the structure of the required fiber without modifying the drawing tools, contrary to a liquid preform.

In other words, a liquid preform, as claimed in claim 1 of the present application, allows such flexibility in the fiber production that a solid preform, as known in PCT-777, could not provide.

On the contrary, PVT-777 provides a drawing step, in particular a thermal drawing step, of a solid cylindrical object.

Therefore the modification of the drawing tools is a necessary step to provide the required fiber.

Secondly, it is only after the drawing step of the present invention, that the liquid preform is cured by means of a UV source due to the presence of a cross-linking starter in the composition(s). Thus at the exit of the die, there is obtained a hardened graded index plastics material optical fiber.

Cross-linking has the advantage that it fixes almost completely the components of the plastics material optical fiber and therefore ensures improved physical and thermal stability of the plastics material optical fiber obtained and the index gradient.

On the contrary, PCT-777 provides, prior to the drawing step, a polymerization step of the prepolymers at 70/75°C, completed at 125°C and by a cooling step to obtain a solid cylindrical object (see col.11 Example).

If, though impossible, a person skilled in the art took into consideration PCT-777, the obtained method would comprise a step of obtaining a solid preform before the drawing step. Therefore, he would modify in a more complex manner the drawing/curing process of Perrin et al. by including a polymerization step prior to a thermal drawing step and he would also adapt the drawing tools.

Hence, the teaching of PCT-777 is not applicable to Perrin et al., and if PCT-777 were applicable to Perrin et al., PCT-777 would even be in contradiction with the method disclosed by Perrin et al. Therefore, it cannot be seen how a person skilled in the

979-032

art, wishing to solve the previously mentioned problem, would find a solution in PCT-777, which concerns an entirely different technical problem, except by hind-sight reconstruction.

Thus, applicant submits that there is no motivation for combining the references as suggested by the Examiner and, even if the references are combinable, the combination does not teach or suggest the presently claimed invention.

In view of these considerations it is respectfully submitted that the rejection of claims 1-6 under 35 U.S.C. 103(a) over a combination of the above-discussed references is overcome and should be withdrawn.

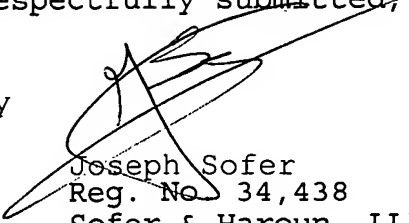
Reconsideration and allowance of the present application are respectfully requested.

Any additional fees or charges required at this time in connection with this application may be charged to Patent and Trademark Office Deposit Account No. 19-2825.

979-032

Respectfully submitted,

By

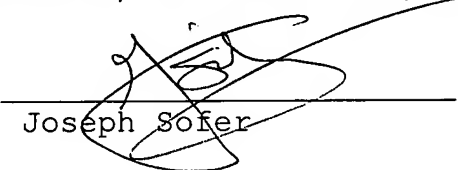

Joseph Sofer
Reg. No. 34,438
Sofer & Haroun, LLP
317 Madison Avenue, Suite 910
New York, New York 10017
(212) 697-2800

Dated: March 14, 2006

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, PO Box 1450 Alexandria, VA 22313-1450, on March 14, 2006.

By:



Joseph Sofer

Date: March 14, 2006